

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1, 4-8, 10, and 12-17 are pending in this application. Claims 1, 4-8, 16 and 17 are amended. As amended Claims 1, 4-8, 16 and 17 are supported by the original claims, no new matter is added.

In the outstanding Official Action, Claims 4 and 5 were objected to; Claims 1, 4-8, 10, 12, and 15-17 were rejected under 35 U.S.C. §103(a) as unpatentable over Genovese (U.S. Patent No. 6,157,400) in view of Endou et al. (U.S. Patent No. 5,128,795, herein “Endou”) and further in view of Kawabata (U.S. Patent No. 5,148,304, herein “Kawabata”); Claims 13 and 14 were rejected under 35 U.S.C. §103(a) as unpatentable over Genovese in view of Endou and Kawabata and further in view of Ono (U.S. Patent No. 5,715,079).

With regard to the objection to Claims 4 and 5, Claims 4 and 5 are amended to depend from Claim 1. Accordingly, the objection to Claims 4 and 5 is believed to be overcome.

With regard to the rejection of Claim 1 under 35 U.S.C. §103(a) as unpatentable over Genovese in view of Endou and Kawabata, that rejection is respectfully traversed.

The optical scanning device recited in amended Claim 1 includes a scanning optical system which provides an amount of linearity at an outer peripheral end of the image surface, and an electrical correction unit which is configured to adjust the secondary frequency of the pixel clock at the output of the frequency dividing unit with respect to each of respective pixels included in the image signal while the amount of linearity remaining at the outer peripheral end of the image surface is provided by the scanning optical system, when the beam spot is located near the outer peripheral end of the image surface, so as to obtain uniform-velocity characteristics. The scanning optical system is configured to satisfy the conditions  $0.5\% \leq |\text{Lin}| \leq 10\%$  where Lin indicates the amount of the linearity. The scanning

optical system includes a scanning lens device having lens surfaces that are concentric with respect to a reflection point of a rotary deflector, and the number of the concentric lens surfaces in the scanning lens device are either equal to or larger than the number of non-concentric lens surfaces in the scanning lens device.

Thus, the scanning optical system recited in Claim 1 provides the amount of linearity remaining at the outer peripheral end of the image surface. The scanning speed becomes relatively large as the beam spot approaches the outer peripheral end of the image surface. Under this condition, the electrical correction unit adjusts the secondary frequency of the pixel clock at the output of the frequency dividing unit with respect to each of respective pixels included in the image signal, so as to obtain the uniform-velocity characteristics. The optical scanning apparatus of the invention recited in Claim 1 is effective in providing good performance for the optical characteristics with the use of a certain amount of linearity remaining at the outer peripheral end of the image surface in the main scanning direction.

Specifically, according to the optical scanning device of the invention recited in Claim 1, the use of a certain amount of linearity remaining at the outer peripheral end of the image surface enables the angle of deflection of a light beam to be reduced. While the beam spot diameter is improved by the optical design using the amount of linearity remaining at the outer peripheral end of the image surface, the electrical correction unit adjusts the secondary frequency of the pixel clock at the output of the frequency dividing unit with respect to each of respective pixels included in the image signal, so as to obtain the uniform-velocity characteristics.

Genovese describes an imaging system having a raster output scanner which produces high quality scan lines including evenly spaced pixels. The raster output scanner is modulated in accordance with a variable frequency pixel clock. However, it appears that Genovese teaches away from the use of an amount of linearity remaining at the outer

peripheral end of the image surface. Further, although the outstanding Office Action cited Genovese as describing “an electrical correction unit” as recited in Claim 1,<sup>1</sup> Genovese does not describe that a secondary frequency of the pixel clock is adjusted at the output of the frequency dividing unit with respect to *each of respective pixels*. In fact, Genovese describes that “a separate frequency is generated for each *group* of 64 sequential pixels.”<sup>2</sup> Thus, Genovese does not teach or suggest “an electrical correction unit configured to adjust the secondary frequency of the pixel clock at the output of the frequency dividing unit with respect to *each of respective pixels* included in the image signal while the amount of linearity remaining at the outer peripheral end of the image surface is provided by the scanning optical system, when the beam spot is located near the outer peripheral end of the image surface, so as to obtain uniform-velocity characteristics,” as recited in amended Claim 1.

Endou shows the scanning lens 5 formed into a high-order aspherical shape so as to maintain the linearity at a desired ratio. It is respectfully submitted that Endou does not teach or suggest “an electrical correction unit” as recited in Claim 1 either.

Finally, Kawabata shows the second scanning lens 10 having the surfaces 10a and 10b constructed in a concentric configuration so as to correct the curvature of field. It is respectfully submitted that Kawabata does not teach or suggest “an electrical correction unit” as recited in Claim 1.

As none of the cited references teaches or suggests “an electrical correction unit” as recited in Claim 1, Claim 1 (and Claims 4 and 5 dependent therefrom) is believed to be patentable over the proposed combination of Genovese, Endou, and Kawabata.

Amended independent Claims 6, 7, 8, 16, and 17 recite similar elements to Claim 1. Accordingly, Claims 6, 7, 8, 16, and 17 (and Claims 10 and 12-15 dependent therefrom) are

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<sup>1</sup>See the outstanding Office Action at page 3, lines 4-12.

<sup>2</sup>Genovese, column 5, lines 64-65. (Emphasis added.)

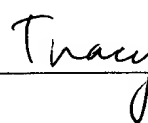
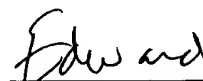
believed to be patentable over Genovese, Endou, and Kawabata for at least the reasons described above with respect to Claim 1.

With regard to the rejection of Claims 13 and 14 as unpatentable over Genovese, Endou, and Kawabata in view of Ono, it is noted that Claims 13 and 14 are dependent from Claim 8, and thus are believed to be patentable for at least the reasons discussed above. Further, it is respectfully submitted that Ono does not cure any of the above-noted deficiencies of the combination of Genovese, Endou, and Kawabata. Accordingly, it is respectfully submitted that Claims 13 and 14 are patentable over Genovese, Endou, and Kawabata in view of Ono.

Accordingly, in view of the present amendment, no further issues are believed to be outstanding and the present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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